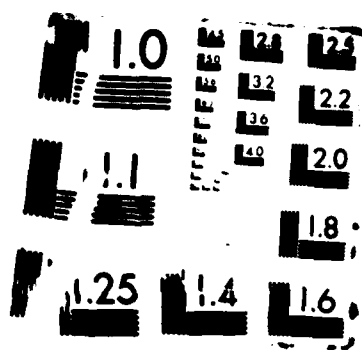


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**AFWAL-TR-86-4006
Volume V
Part 22**

**DTIC
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JUL 07 1987**



**INTEGRATED INFORMATION
SUPPORT SYSTEM (IISS)
Volume V - Common Data Model Subsystem
Part 22 - NDML Precompiler Build Calls and Messages
Product Specification**

**General Electric Company
Production Resources Consulting
One River Road
Schenectady, New York 12345**

**Final Report for Period 22 September 1980 - 31 July 1985
November 1985**

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**MATERIALS LABORATORY
AIR FORCE WRIGHT AERONAUTICAL LABORATORIES
AIR FORCE SYSTEMS COMMAND
WRIGHT-PATTERSON AFB, OH 45433-6535**

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19. ABSTRACT (Continue on reverse if necessary and identify by block number)			
<p>→ This document is the product specification establishing the design implementation of the IISS Configuration Item PRE10 which will generate code into a user's program which can communicate with other generated code and components of the distributed request processing architecture of IISS. → See p 1-1</p>			
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Part 22 - NDML Precompiler Build Calls and Messages
Product Specification

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PREFACE

This product specification covers the work performed under Air Force Contract F33615-80-C-5155 (ICAM Project 6201). This contract is sponsored by the Materials Laboratory, Air Force Systems Command, Wright-Patterson Air Force Base, Ohio. It was administered under the technical direction of Mr. Gerald C. Shumaker, ICAM Program Manager, Manufacturing Technology Division, through Project Manager, Mr. David Judson. The Prime Contractor was Production Resources Consulting of the General Electric Company, Schenectady, New York, under the direction of Mr. Alan Rubenstein. The General Electric Project Manager was Mr. Myron Hurlbut of Industrial Automation Systems Department, Albany, New York.

Certain work aimed at improving Test Bed Technology has been performed by other contracts with Project 6201, performing integrating functions. This work consisted of enhancements to Test Bed software and establishment and operation of Test Bed hardware and communications for developers and other users. Documentation relating to the Test Bed from all of these contractors and projects have been integrated under Project 6201 for publication and treatment as an integrated set of documents. The particular contributors to each document are noted on the Report Documentation Page (DD1473). A listing and description of the entire project documentation system and how they are related is contained in document FTR620100001, Project Overview.

The subcontractors and their contributing activities were as follows:

TASK 4.2

Subcontractors

Role

Boeing Military Aircraft
Company (EMAC)

Reviewer.

D. Appleton Company
(DAGOM)

Responsible for IDEF support,
state-of-the-art literature
search.

General Dynamics/
Ft. Worth

Responsible for factory view
function and information
models.

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Subcontractors

Role

Illinois Institute of
Technology

Responsible for factory view
function research (IITRI)
and information models of
small and medium-size business.

North American Rockwell

Reviewer.

Northrop Corporation

Responsible for factory view
function and information
models.

Pritsker and Associates

Responsible for IDEF2 support.

SofTech

Responsible for IDEFO support.

TASKS 4.3 - 4.9 (TEST BED)

Subcontractors

Role

Boeing Military Aircraft
Company (EMAC)

Responsible for consultation on
applications of the technology
and on IBM computer technology.

Computer Technology
Associates (CTA)

Assisted in the areas of
communications systems, system
design and integration
methodology, and design of the
Network Transaction Manager.

Control Data Corporation
(CDC)

Responsible for the Common Data
Model (CDM) implementation and
part of the CDM design (shared
with DACOM).

D. Appleton Company
(DACOM)

Responsible for the overall CDM
Subsystem design integration
and test plan, as well as part
of the design of the CDM
(shared with CDC). DACOM also
developed the Integration
Methodology and did the schema
mappings for the Application
Subsystems.

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<u>Subcontractors</u>	<u>Role</u>
Digital Equipment Corporation (DEC)	Consulting and support of the performance testing and on DEC software and computer systems operation.
McDonnell Douglas Automation Company (McAuto)	Responsible for the support and enhancements to the Network Transaction Manager Subsystem during 1984/1985 period.
On-Line Software International (OSI)	Responsible for programming the Communications Subsystem on the IBM and for consulting on the IBM.
Rath and Strong Systems Products (RSSP) (In 1985 became McCormack & Dodge)	Responsible for assistance in the implementation and use of the MRP II package (PIOS) that they supplied.
SofTech, Inc.	Responsible for the design and implementation of the Network Transaction Manager (NTM) in 1981/1984 period.
Software Performance Engineering (SPE)	Responsible for directing the work on performance evaluation and analysis.
Structural Dynamics Research Corporation (SDRC)	Responsible for the User Interface and Virtual Terminal Interface Subsystems.

Other prime contractors under other projects who have contributed to Test Bed Technology, their contributing activities and responsible projects are as follows:

<u>Contractors</u>	<u>ICAM Project</u>	<u>Contributing Activities</u>
Boeing Military Aircraft Company (BMAC)	1701, 2201, 2202	Enhancements for IBM node use. Technology Transfer to Integrated Sheet Metal Center (ISMC).

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<u>Contractors</u>	<u>ICAM Project</u>	<u>Contributing Activities</u>
Control Data Corporation (CDC)	1502, 1701	IISS enhancements to Common Data Model Processor (CDMP).
D. Appleton Company (DACOM)	1502	IISS enhancements to Integration Methodology.
General Electric	1502	Operation of the Test Bed and communications equipment.
Hughes Aircraft Company (HAC)	1701	Test Bed enhancements.
Structural Dynamics Research Corporation (SDRC)	1502, 1701, 1703	IISS enhancements to User Interface/Virtual Terminal Interface (UI/VTI).
Systran	1502	Test Bed enhancements. Operation of Test Bed.

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SECTION 1

SCOPE

1.1 Identification

This specification establishes the design of Function PRE10, Build Calls Messages into the Users AP, one of the major functions of the Configuration Item Precompiler to be built and formally accepted by the ICAM Program Office. This CI constitutes one of the subsystems of the Common Data Model Processor (CDMP).

1.2 Functional Summary

The purpose of this Computer Program Configuration Item (CPCI) is to generate into the User Application process code to assemble tables and parameters needed by both the Distributed Request Supervisor and conceptual to external transformer to satisfy an NDML request. *Keywords: ICIP (Integrated Computer Product Manufacturing)*

The following functions will be performed by the CPCI:

1. Generate working storage for external schema variables to hold the ES results in the user specified structure or variables, and temporary conceptual schema variables necessary for the transformation.
2. Generate working storage variables to hold the precompile tables namely the Join Query Graph, Attribute Pair List, results table and conceptual schema Action List to satisfy the NDML request.
3. Generate Working Storage and Procedure Division statements for domain and assertion checks.
4. Generate Procedure Division statements to call the DRS, return with the results and call the conceptual to external transformer and move the ES results into the user variables or structure.

SECTION 2
DOCUMENTS

2.1 Reference Documents

1. ICAM Documentation Standards: IDS15012000A, 28 December 1981.
2. D. Appleton Co., CDM Administrators Manual: UM620141000, March, 1984.
3. D. Appleton Co., CDM1-IDEF, Model of the Common Data Model: CCS620141000, 15 May, 1985.
4. D. Appleton Co., Computer Program Development Specification (DS) for ICAM Integrated Support System (IISS) Configuration Item: NDML Precompiler: DS620141200, October, 1984
5. D. Appleton Co., Embedded NDML Programmers Reference Manual: PRM620141200, March, 1985
6. Softech, Inc., NTM Programmers Guide: UM620140001, July 1984.
7. Control Data Corp., Computer Program Development Specification (DS) for ICAM Integrated Support System (IISS) Configuration Item: NDDL Command Processor: DS620141100, June 1985.

2.2 Terms and Abbreviations

Attribute Use Class: (AUC)

Conceptual Schema: (CS)

Common Data Model Processor: (CDMP)

Common Data Model: (CDM) Describes common data application process formats, form definitions, etc, of the IISS and includes conceptual schema, external, internal schemas, and schema transformation operators.

Data Field: (DF) An element of data in the external schema. It is by this name that an NDML programmer references

data.

Database Management System: (DBMS)

Distributed Request Supervisor: (DRS) This IISS CDM subsystem configuration item controls the execution of distributed NDML queries and non distributed updates.

Domain: A logical definition of legal attribute class values.

Domain Constraint: Predicate that applies to a single domain.

External Schema: (ES)

Forms: Structured views which may be imposed on windows or other forms. A form is composed of fields where each field is a form, item, or window.

Forms Processor: (FP) A set of callable execution time routines available to an application program for form processing.

Internal Schema: (IS)

Integrated Information Support System: (IISS) A test computing environment used to investigate, demonstrate and test the concepts of information management and information integration in the context of Aerospace Manufacturing. The IISS addresses the problems of integration of data resident on heterogeneous databases supported by heterogeneous computers interconnected via a local Area Network.

Mapping: The correspondence of independent objects in two schemas: ES to CS or CS to IS.

Network Transaction Manager: (NTM) Performs the coordination, communication and housekeeping functions required to integrate the application processes and system services resident on the various hosts into a cohesive system.

Neutral Data Manipulation Language: (NDML) A language developed by the IISS project to provide uniform access to common data, regardless of database manager or distribution criteria. It provides distributed retrieved and single node updates.

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ORACLE: Relational DBMS based on the SQL (Structured Query Language, a product of ORACLE Corp, Menlo Park, CA). The CDM is an ORACLE database.

Parcel: A sequential file containing sections of source code of the input Application Program.

Request Processor: (RP) A COBOL program that will satisfy a retrieval or update NDML subtransaction against a particular Database Management System.

User Interface: (UI) Controls the user's terminal and interfaces with the rest of the system.

Virtual Terminal Interface: (VTI) Performs the interfacing between different terminals and the UI. This is done by defining a specific set of terminal features and protocols which must be supported by UI software which constitutes the Virtual Terminal Definition. Specific terminals are then mapped against the Virtual Terminal software by specific software modules written for each type of real terminal supported.

SECTION 3

REQUIREMENTS

3.1 Structural Description

The graphic portrayal of this CPCI is included in Section 3.10. This chart shows the hierarchical relationship of each module making up this CPCI.

This CPCI uses a number of lower level modules to handle specific operations such as:

1. Generate working storage for data definitions for Delete, Modify and Qualify data values (CDECWS).
2. Generate working storage for data definitions for insert values (CDP10E).
3. Generate working storage variables to hold ES results (CDP10F).
4. Generate the precompile tables needed by the Distributed Request Supervisor (DRS) into the Users AP, and Procedure division statements to move the results (CDP10B).
5. Generate the Working Storage and Procedure Division statements to perform domain and assertion verification (CDGCONS).
6. Generate Procedure Division statements for transforming the external to conceptual and, if necessary, generate working storage if an algorithm was required to do the transformation (CDEC).
7. Control the processing logic to call routines to transform Working Storage and Procedure Division statements from conceptual to external (CDP10A).
8. Generate the final ES Results into user specified structure, variables or a file.

3.2 Functional Flow

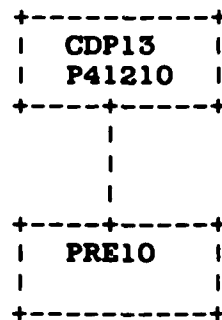
This CPCI implemented the logic defined in the Development

Specification for this CPCI. Details of inputs/outputs and relationships between modules are found in Section 3.10.

This CPCI has been designated to operate in a batch or interactive mode. It must operate in the system environment established for IISS; that is, the Network Transaction Manager. It currently can only be executed on the DEC VAX due to the dependence on the VAX sort although this can be changed for execution on the IBM.

3.3 Interfaces

The following diagram depicts the interface of this CPCI, PRE10 with other CPCI's in the system.



3.3.1 Inputs/Outputs

The following table depicts the inputs and outputs of this CPCI. A detailed description for each item can be found in the DS for this CPCI.

FUNCTION: PRE10

INPUT	OUTPUT
External Schema Action List	Module Status
External Schema Qualify List	
Conceptual Schema Action List	
Conceptual Schema Qualify List	
Internal Schema Action List	
Internal Schema Qualify List	
Join Query Graph	
JQG Attribute Pair List	
Results Field Table	
Subtrans Process ID table	
Code Generator Table	
ORACLE Log on Data Area	
IDFile Name	
FDFFile Name	
Working Storage File Name	
Procedure Division File Name	
Error File	
CS-ES Mod Name	
User View Abbreviation List	
ID Section Indicator	

3.4 Program Interrupts

Not applicable to the CPCI.

3.5 Timing and Sequencing Description

This CPCI is called for each NDML statement to generate calls to the Distributed Request Supervisor and/or Conceptual to External transformer, so the results may be returned in the manner the user specified.

3.6 Special Control Features

Not applicable to this CPCI.

3.7 Storage Allocation

3.7.1 Database Definition

The database used by this CPCI is the Common Data Model (CDM) database. The model is defined by the CDM1, the IDEF-1 model of the CDM, Reference Document Number 3.

3.7.1.1 File Description

No permanent files have been defined for this CPCI. It may use temporary scratch files for such things as input and results.

3.7.1.2 Table Description

All tables used by this CPCI have been defined by the Development Specification for this CPCI.

3.7.1.3 Item Description

Not applicable to this CPCI.

3.8 Object Code Creation

The object code for this CPCI will be created by the system integration team using defined IISS Software Configuration Management Procedures. This CPCI will use the COBOL language compiler.

3.9 Adaptation Data

This CPCI has been using ANSI COBOL language. The intent was to provide a transportable system. Any system environment supporting these languages, a virtual memory management schema, the COMM and NTM subsystems of IISS and the ORACLE Database Management System should be able to support this CPCI. Every possible attempt has been made to localize and identify any machine or environment dependent modules through the original design of the IISS and application of Configuration Management Procedures.

3.10 Detail Design Description

The following sections have been computer generated for this CPCI.

3.10.1 Main Program List

The following is a list of all "Main Programs" which are modules that are not called by any other module being documented here. These modules are either program entry points or, if they are hooked into another set of programs via subroutine calls, they are the points the external programs can call and therefore enter through. To differentiate between the two types of entry points, look at the individual Module Documentation (section 3.10.8) and look at Module Type for each of the Main Program modules listed. Note whether the routine is a Program, Subroutine, or Function. If it is a Program, it is truly a main program entry point. If not, then it is merely called by other programs not being documented here.

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BUILD CALLS AND MESSAGES Main Program List

Module Name -----	Purpose -----
CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS

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3.10.2 Module List

The following is a list of all the modules being documented here along with their purpose. Each module has a unique name, no matter what language it was written in.

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BUILD CALLS AND MESSAGES Module List

Module Name -----	Purpose -----
CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
CDEC	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
CDP10C	GENERATE ES RESULTS INTO USER VARIABLES OR STRUCTURE
CDP10E	GENERATE ES/CS DATA DEFINITIONS FOR INSERT VALUES
CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS
CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS

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3.10.3 External Routines List

The following is a list of all routines or functions not documented here that are called by modules that are documented here. The first caller, in alphabetical order, is listed as well. The specification in which any module is documented may be found in the Module Documentation Index (Document Number CM 620100001). See section 3.10.6 for a list of the modules that call each of these external routines.

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BUILD CALLS AND MESSAGES External Routines List

Module Name -----	First User -----
CDMACR	CDP10A
CDPIC	CDP10F
ERRPRO	CDP10B
OBINDN	CDCONS
OCLOSE	CDEC
ODFINN	CDCONS
OEXEC	CDCONS
OFETCH	CDCONS
OOPEN	CDCONS
OSQL3	CDEC
RPTERR	CDCONS

3.10.4 Include File List

The following is a list of all include files called in by modules being documented here. Each include file has a unique name regardless of the language being used. The purpose of each include file is listed as well. A more complete description of each include file is given in section 3.10.9. The purpose listed is the one that is in the source code of the include file.

A purpose of "**** PURPOSE NOT FOUND BY STRIPPER ****" indicates that a purpose statement was not written into the include file itself. The most common reason for this is that the include file comes from system libraries that were not developed by the project, such as 'C' libraries that are provided with the 'C' compiler.

See section 3.10.6 for a set of lists which show all the modules which call in each of these include files.

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BUILD CALLS AND MESSAGES Include File List

File Name	Purpose
-----	-----
APL	JOIN QUERY ATTRIBUTE PAIR LIST
CGTABLE	CODE GENERATING TABLE- TRACKS ALL GENERATED SOFTWARE
CHKCDM	IISS CDMF CHECK STATUS CODES
CSAL	CONCEPTUAL SCHEMA ACTION LIST
CSQUAL	CONCEPTUAL SCHEMA QUALIFY LIST
ERRCDM	IISS ERROR STATUS CODES FOR CDMF MODULES
ERRPRO	PROCESS ERROR INCLUDE FILE
ESAL	EXTERNAL SCHEMA ACTION LIST
ESQUAL	EXTERNAL SCHEMA QUALIFY LIST
ISAL	INTERNAL SCHEMA ACTION LIST
ISQUAL	INTERNAL SCHEMA QUALIFY LIST
JQGTBL	JOIN QUERY GRAPH TELLS HOW TO CONNECT SUBTRANSACTIONS
LANGNO	SOURCE LANGUAGE VARIABLE
MACCALL	CALL THE MACRO COPY UTILITY
ORCLEDA	WS DEFINITION FOR THE ORACLE LOGIN AREA
RFTABLE	THE RESULT FIELD TABLE
SBSTLST	WS DEFINITION FOR THE SUBSTITUTION LIST TABLE
SUBPROC	SUBTRANSACTION PROCESSES ID TABLE
UVABBR	USER VIEW ABBREVIATION LIST

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3.10.5 Where Include File Used List

The following lists each include file from 3.10.4 and all the modules documented in this specification which include them. The purpose of each module is listed as well.

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BUILD CALLS AND MESSAGES Where-include-file-used List

Include File -----	Module Name -----	Module Purpose -----
APL		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
CGTABLE		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
CHKCDM		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
CSAL		
	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
	CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS

BUILD CALLS AND MESSAGES Where-include-file-used List

Include File	Module Name	Module Purpose
-----	-----	-----
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
CSQUAL		
	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
ERRCDM		
	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDEC	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
	CDP10C	GENERATE ES RESULTS INTO USER VARIABLES OR STRUCTURE
	CDP10E	GENERATE ES/CS DATA DEFINITIONS FOR INSERT VALUES
	CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS

BUILD CALLS AND MESSAGES Where-include-file-used List

Include File -----	Module Name -----	Module Purpose -----
ERRPRO		
	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDEC	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
	CDP10C	GENERATE ES RESULTS INTO USER VARIABLES OR STRUCTURE
	CDP10E	GENERATE ES/CS DATA DEFINITIONS FOR INSERT VALUES
	CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
ESAL		
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES .INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10C	GENERATE ES RESULTS INTO USER VARIABLES OR STRUCTURE
	CDP10E	GENERATE ES/CS DATA DEFINITIONS FOR INSERT VALUES

BUILD CALLS AND MESSAGES Where-include-file-used List

Include File	Module Name	Module Purpose
-----	-----	-----
	CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
 ESQUAL		
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
 ISAL		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
 ISQUAL		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
 JQGTBL		

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BUILD CALLS AND MESSAGES Where-include-file-used List

Include File -----	Module Name -----	Module Purpose -----
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
 LANGNO		
	CDGONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDEC	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
	CDP10C	GENERATE ES RESULTS INTO USER VARIABLES OR STRUCTURE
	CDP10E	GENERATE ES/CS DATA DEFINITIONS FOR INSERT VALUES
	CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
 MACCALL		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP

BUILD CALLS AND MESSAGES Where-include-file-used List

Include File -----	Module Name -----	Module Purpose -----
 ORCLEDA		
	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDEC	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
 RFTABLE		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
 SBSTLST		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
 SUBPROC		

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BUILD CALLS AND MESSAGES Where-include-file-used List

Include File -----	Module Name -----	Module Purpose -----
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
 UVABBR	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES

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3.10.6 Where External Routine Used List

The following lists each external function or routine listed in 3.10.3 and all the documented modules which call it. The purpose of each module is listed as well.

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BUILD CALLS AND MESSAGES Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
CDMACR		
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
CDPIC		
	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDEC	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10E	GENERATE ES/CS DATA DEFINITIONS FOR INSERT VALUES
	CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS
ERRPRO		
	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE
	CDEC	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
	CDECWS	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
	CDP10	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDP10A	GENERATE THE TRANSFORMATION OF ES VALUES AND VARIABLES
	CDP10B	GENERATED THE PRECOMPILE TABLES INTO THE USERS AP
	CDP10C	GENERATE ES RESULTS INTO USER VARIABLES OR STRUCTURE
	CDP10E	GENERATE ES/CS DATA DEFINITIONS FOR INSERT VALUES

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BUILD CALLS AND MESSAGES Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
	CDP10F	GENERATE WORKING STORAGE VARIABLES TO HOLD ES RESULTS
	CDUEMV	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
 OBINDM	 CDCONS CDEC	 DOMAIN AND ASSERTION VERIFICATION MODULE GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
 OCLOSE	 CDCONS CDEC	 DOMAIN AND ASSERTION VERIFICATION MODULE GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
 ODFINH	 CDCONS CDEC	 DOMAIN AND ASSERTION VERIFICATION MODULE GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
 OEXEC	 CDCONS CDEC	 DOMAIN AND ASSERTION VERIFICATION MODULE GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
 OFETCH	 CDCONS CDEC	 DOMAIN AND ASSERTION VERIFICATION MODULE GENERATES WS AND PROC DIV FOR DF FOR ES TO CS

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BUILD CALLS AND MESSAGES Where-external-routine-used List

System Module -----	Module Name -----	Module Purpose -----
OOPEN	CDCONS CDEC	DOMAIN AND ASSERTION VERIFICATION MODULE GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
OSQL3	CDCONS CDEC	DOMAIN AND ASSERTION VERIFICATION MODULE GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
RPTERR	CDCONS	DOMAIN AND ASSERTION VERIFICATION MODULE

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3.10.7 Main Program Parts List

The following lists each Main Program listed in 3.10.1 and all the modules which are called either by that module itself or by any of the documented modules which it calls. It is possible for a non-main module to be listed more than once if it is called by multiple modules. The called modules, in this case known as program parts, are marked as to whether they are documented here. If so, the phrase "well-defined module" appears by the module name, if not it is an "external routine". The Purpose of the Main Program module is listed as well.

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BUILD CALLS AND MESSAGES Main Program Parts List

Main Pgm Name -----	Module Name -----	Module Type -----
CDP10	Purpose--	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
	CDCONS	Well-defined module
	CDEC	Well-defined module
	CDECWS	Well-defined module
	CDMACR	External routine
	CDP10A	Well-defined module
	CDP10B	Well-defined module
	CDP10C	Well-defined module
	CDP10E	Well-defined module
	CDP10F	Well-defined module
	CDPIC	External routine
	CDUEMV	Well-defined module
	ERRPRO	External routine
	OBINDN	External routine
	OCLOSE	External routine
	ODFINN	External routine
	OEXEC	External routine
	OFETCH	External routine
	OOPEN	External routine
	OSQL3	External routine
	RPTERR	External routine

3.10.8 Module Documentation

The following documentation describes information which is specific to each individual module being documented in this specification as listed in section 3.10.2. It provides a compact way of getting information that would be otherwise buried within each module's source code.

The specific items in this module documentation have the following meanings:

NAME:	Name of program Module.
PURPOSE:	Purpose of Module as detailed in the source code.
LANGUAGE:	Programming language source code is written in. The choices are: VAX-11 FORTRAN C (I/S-1 Workbench 'C') VAX-11 COBOL
MODULE TYPE:	Whether a Program, Subroutine, or Function.
SOURCE FILE:	Name of Source File from file specification.
SOURCE FILE TYPE:	Source File Extension from file specification.
HOST:	Whether this is a host-dependent routine (VAX or IBM) or blank if host-independent.
SUBSYSTEM:	IISS sub-system this file resides in.
SUBDIRECTORY:	Sub-directory of that subsystem in which this file resides.
DOCUMENTATION GROUP:	Name of documentation group of which this source file is a member.
DESCRIPTION:	A description of the module as obtained

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from the source code.

ARGUMENTS: The arguments with which this routine is called if it is a Subroutine or a Function.

INCLUDE FILES: A list of all the files that are included into this module as well as their purposes.

ROUTINES CALLED: Subroutines or Functions, either documented or external, called by this module, if any.

CALLED DIRECTLY BY: The documented routines which call this module, if any.

USED IN MAIN PROGRAM(S): The documented Main Programs which contain this module in their parts list according to the list in section 3.10.7.

The Module Documentation is arranged alphabetically according to Module Name.

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDCONS
PURPOSE: DOMAIN AND ASSERTION VERIFICATION MODULE
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDCONS
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

-

ARGUMENTS:

LANG-NO = RECRD
ORACLE-LDA = RECRD
CS-ACTION-LIST = RECRD
CS-QUALIFY-LIST = RECRD
WORK-FILE-NAME = DSPLY [X(30)]
PROC-FILE-NAME = DSPLY [X(30)]
NEXT-PARAMETER-NO = DSPLY [999]
ES-NDML-NO = DSPLY [999]
ERROR-FILE = DSPLY [X(30)]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDM MODULES
LANGNO - SOURCE LANGUAGE VARIABLE
ORCLEDA - WS DEFINITION FOR THE ORACLE LOGIN AREA
CSAL - CONCEPTUAL SCHEMA ACTION LIST
CSQUAL - CONCEPTUAL SCHEMA QUALIFY LIST
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

RPTERR

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CDPIC
OOPEN
OSQL3
ODFINN
OBINDN
OEXEC
OFETCH
OCLOSE
ERRPRO

CALLED DIRECTLY BY:

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
 APPLICATION PROCESS

USED IN MAIN PROGRAM(S):

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
 APPLICATION PROCESS

BUILD CALLS AND MESSAGES Module Documentation

NAME: CDEC
PURPOSE: GENERATES WS AND PROC DIV FOR DF FOR ES
TO CS
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDEC
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

- - THIS ROUTINE WILL GENERATE WORKING STORAGE
-
CODE WILL BE GENERATED INTO THE WORKING STORAGE

ARGUMENTS:

LANG-NO = RECRD
WORK-FILE-NAME = DSPLY [X(30)]
PROC-FILE-NAME = DSPLY [X(30)]
ORACLE-LDA = RECRD
NEXT-PARAMETER-NO = DSPLY [9(3)]
CLIST-INDEX = DSPLY [99]
ELIST-INDEX = DSPLY [99]
ACTION-TYPE = DSPLY [X]
ES-ACTION-TYPE = DSPLY [X]
ES-NDML-NO = DSPLY [999]
CS-NDML-NO = DSPLY [999]
SEC-ID = DSPLY [X(30)]
DI-ID = DSPLY [X(30)]
VAR-OR-FILE-IND = DSPLY [X]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDMF MODULES
LANGNO - SOURCE LANGUAGE VARIABLE
ORCLEDA - WS DEFINITION FOR THE ORACLE LOGIN AREA
ERRPRO - PROCESS ERROR INCLUDE FILE

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ROUTINES CALLED:

OOPEN
OSQL3
ODFINN
OBINDN
OEXEC
OFETCH
CDPIC
OCLOSE
ERRPRO

CALLED DIRECTLY BY:

CDP10A - GENERATE THE TRANSFORMATION OF ES VALUES AND
VARIABLES

USED IN MAIN PROGRAM(S):

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDECWS
PURPOSE: ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL
DATA VALUES
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDECWS
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

EXTERNAL/CONCEPTUAL SCHEMA DATA DEFINITIONS
FOR RUNTIME INSERT, MODIFY AND QUALIFY DATA VALUES

CODE WILL BE GENERATED INTO THE WORKING STORAGE
SECTION OF THE MODIFIED AP, DEPENDING ON THE
CS-ACTION

THE FOLLOWING CODE WILL BE GENERATED :

01 CS-VAR-NDMLNO-NN PIC TYPE(SIZE)[V9(ND)].
01 CSQ-VAR-NDMLNO-NN PIC TYPE(SIZE)[V9(ND)].
01 ES-VAR-NDMLNO-NN PIC TYPE(SIZE)[V9(ND)].
01 ESQ-VAR-NDMLNO-NN PIC TYPE(SIZE)[V9(ND)].
WHERE NN IS EITHER THE CS-ES-PTR OR CSQ-ES-PTR
OR CS-INDEX OR CSQ-INDEX.

ARGUMENTS:

LANG-NO = RECRD
WORK-FILE-NAME = DSPLY [X(30)]
CS-ACTION-LIST = RECRD
CS-QUALIFY-LIST = RECRD
ES-ACTION-LIST = RECRD
ES-QUALIFY-LIST = RECRD
RET-STATUS = DSPLY [X(5)]

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INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDMP MODULES
LANGNO - SOURCE LANGUAGE VARIABLE
CSAL - CONCEPTUAL SCHEMA ACTION LIST
CSQUAL - CONCEPTUAL SCHEMA QUALIFY LIST
ESAL - EXTERNAL SCHEMA ACTION LIST
ESQUAL - EXTERNAL SCHEMA QUALIFY LIST
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

CDPIC
ERRPRO

CALLED DIRECTLY BY:

CDP10A - GENERATE THE TRANSFORMATION OF ES VALUES AND
VARIABLES

USED IN MAIN PROGRAM(S):

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
APPLICATION PROCESS

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDP10
PURPOSE: BUILD CALLS AND MESSAGES INTO THE USERS
APPLICATION PROCESS
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDP10
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

GENERATES CODE INTO THE USERS APPLICATION PROGRAM REQUIRED
TO PROCESS THE NDML REQUEST AT RUNTIME. THIS INCLUDES CODE
TO ASSEMBLE TABLES AND PARAMETERS NEEDED BY THE DISTRIBUTED
REQUEST SUPERVISOR TO SATISFY AN NDML REQUEST AND CODE TO
RECEIVE THE RESULTS FROM THE REQUEST.

ARGUMENTS:

ES-ACTION-LIST = RECRD
ES-QUALIFY-LIST = RECRD
CS-ACTION-LIST = RECRD
CS-QUALIFY-LIST = RECRD
IS-ACTION-LIST = RECRD
IS-QUALIFY-LIST = RECRD
JQG = RECRD
JQG-ATTRIBUTE-PAIR-LIST = RECRD
RPT = RECRD
SUBTRANS-PROCESS-ID-TABLE = RECRD
CODE-GENERATOR-TABLE = RECRD
ORACLE-LDA = RECRD
IDFILE-NAME = DSPLY [X(30)]
PFILE-NAME = DSPLY [X(30)]
WORKFILE-NAME = DSPLY [X(30)]
PROCFE-NAME = DSPLY [X(30)]
ERROR-FILE = DSPLY [X(30)]

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CS-ES-MOD-NAME = DSPLY [X(10)]
SOURCE-LANGUAGE = DSPLY [X(10)]
UV-ABBR-LIST = RECRD
IOSECTION-INDICATOR = DSPLY [9]
RETURN-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDMP MODULES
CHKCDM - IISS CDMP CHECK STATUS CODES
SBSTLST - WS DEFINITION FOR THE SUBSTITUTION LIST TABLE
LANGNO - SOURCE LANGUAGE VARIABLE
ESAL - EXTERNAL SCHEMA ACTION LIST
ESQUAL - EXTERNAL SCHEMA QUALIFY LIST
CSAL - CONCEPTUAL SCHEMA ACTION LIST
CSQUAL - CONCEPTUAL SCHEMA QUALIFY LIST
ISAL - INTERNAL SCHEMA ACTION LIST
ISQUAL - INTERNAL SCHEMA QUALIFY LIST
JQGTBL - JOIN QUERY GRAPH TELLS HOW TO CONNECT
SUBTRANSACTIONS
APL - JOIN QUERY ATTRIBUTE PAIR LIST
RFTABLE - THE RESULT FIELD TABLE
SUBPROC - SUBTRANSACTION PROCESSES ID TABLE
CGTABLE - CODE GENERATING TABLE- TRACKS ALL GENERATED
SOFTWARE
UVABBR - USER VIEW ABBREVIATION LIST
ORCLEDA - WS DEFINITION FOR THE ORACLE LOGIN AREA
MACCALL - CALL THE MACRO COPY UTILITY
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

CDP10C - GENERATE ES RESULTS INTO USER VARIABLES OR
STRUCTURE
CDP10A - GENERATE THE TRANSFORMATION OF ES VALUES AND
VARIABLES
CDP10B - GENERATED THE PRECOMPILE TABLES INTO THE USERS
AP
CDP10E - GENERATE ES/CS DATA DEFINITIONS FOR INSERT
VALUES
CDP10F - GENERATE WORKING STORAGE VARIABLES TO HOLD ES
RESULTS
CDCONS - DOMAIN AND ASSERTION VERIFICATION MODULE
CDMACR
ERRPRO

BUILD CALLS AND MESSAGES Module Documentation

NAME: CDP10A
PURPOSE: GENERATE THE TRANSFORMATION OF ES VALUES
AND VARIABLES
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDP10A
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

-
-

ARGUMENTS:

LANG-NO = RECRD
FD-FILE-NAME = DSPLY [X(30)]
WORK-FILE-NAME = DSPLY [X(30)]
PROC-FILE-NAME = DSPLY [X(30)]
CS-ACTION-LIST = RECRD
CS-QUALIFY-LIST = RECRD
ES-ACTION-LIST = RECRD
ES-QUALIFY-LIST = RECRD
IS-ACTION-LIST = RECRD
IS-QUALIFY-LIST = RECRD
UV-ABBR-LIST = RECRD
CODE-GENERATOR-TABLE = RECRD
SUBTRANS-PROCESS-ID-TABLE = RECRD
ORACLE-LDA = RECRD
NEXT-PARAMETER-NO = DSPLY [999]
ERROR-FILE = DSPLY [X(30)]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

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ERRCDM	-	IISS ERROR STATUS CODES FOR CDMP MODULES
SBSTLST	-	WS DEFINITION FOR THE SUBSTITUTION LIST TABLE
LANGNO	-	SOURCE LANGUAGE VARIABLE
ORCLEDA	-	WS DEFINITION FOR THE ORACLE LOGIN AREA
ESAL	-	EXTERNAL SCHEMA ACTION LIST
ESQUAL	-	EXTERNAL SCHEMA QUALIFY LIST
ISAL	-	INTERNAL SCHEMA ACTION LIST
ISQUAL	-	INTERNAL SCHEMA QUALIFY LIST
CSAL	-	CONCEPTUAL SCHEMA ACTION LIST
CSQUAL	-	CONCEPTUAL SCHEMA QUALIFY LIST
CGTABLE	-	CODE GENERATING TABLE- TRACKS ALL GENERATED SOFTWARE
SUBPROC	-	SUBTRANSACTION PROCESSES ID TABLE
UVABBR	-	USER VIEW ABBREVIATION LIST
ERRPRO	-	PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

CDECWS	-	ES/CS DATA DEF FOR RT INSERT/MODIFY/QUAL DATA VALUES
CDUEMV	-	GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE STATEMENTS
CDEC	-	GENERATES WS AND PROC DIV FOR DF FOR ES TO CS
CDMACR		
ERRPRO		

CALLED DIRECTLY BY:

CDP10	-	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
-------	---	---

USED IN MAIN PROGRAM(S):

CDP10	-	BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS
-------	---	---

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDP10B
PURPOSE: GENERATED THE PRECOMPILE TABLES INTO THE
USERS AP
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDP10B
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

- GENERATE THE TRANSFER OF PRECOMPILE
TABLES INTO THE USERS AP. THESE TABLES INCLUDE:
JQG - JOIN QUERY GRAPH
APL - ATTRIBUTE PAIR LIST
RFT - RESULT FIELD TABLE
CSAL - CONCEPTUAL SCHEMA ACTION LIST

-
GENERATE WORKING STORAGE VARIABLES TO HOLD THE
PRECOMPILE TABLES REQUIRED FOR THE NDML REQUEST. THEN
POPULATE THESE VARIABLES WITH PRECOMPILED RESULTS
REQUIRED FOR THE NDML REQUEST.

ARGUMENTS:

LANG-NO = RECRD
WORKFILE-NAME = DSPLY [X(30)]
PROCFIL-NAME = DSPLY [X(30)]
ES-NDML-NO = DSPLY [999]
JQG = RECRD
JQG-ATTRIBUTE-PAIR-LIST = RECRD
RFT = RECRD
CS-ACTION-LIST = RECRD
ORACLE-LDA = RECRD
RETURN-STATUS = DSPLY [X(5)]

INCLUDE FILES:

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ERRCDM - IISS ERROR STATUS CODES FOR CDMP MODULES
CHKCDM - IISS CDMP CHECK STATUS CODES
SBSTLST - WS DEFINITION FOR THE SUBSTITUTION LIST TABLE
LANGNO - SOURCE LANGUAGE VARIABLE
JQGTBL - JOIN QUERY GRAPH TELLS HOW TO CONNECT
 SUBTRANSACTIONS
APL - JOIN QUERY ATTRIBUTE PAIR LIST
RFTABLE - THE RESULT FIELD TABLE
CSAL - CONCEPTUAL SCHEMA ACTION LIST
ORCLEDA - WS DEFINITION FOR THE ORACLE LOGIN AREA
MACCALL - CALL THE MACRO COPY UTILITY
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

CDMACR
ERRPRO

CALLED DIRECTLY BY:

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
 APPLICATION PROCESS

USED IN MAIN PROGRAM(S):

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
 APPLICATION PROCESS

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDP10C
PURPOSE: GENERATE ES RESULTS INTO USER VARIABLES
OR STRUCTURE
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDP10C
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

-
-

ARGUMENTS:

LANG-NO = RECRD
PROC-FILE-NAME = DSPLY [X(30)]
ES-ACTION-LIST = RECRD
CS-NDML-NO = DSPLY [999]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDMP MODULES
LANGNO - SOURCE LANGUAGE VARIABLE
ESAL - EXTERNAL SCHEMA ACTION LIST
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

ERRPRO

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CALLED DIRECTLY BY:

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
 APPLICATION PROCESS

USED IN MAIN PROGRAM(S):

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
 APPLICATION PROCESS

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDP10E
PURPOSE: GENERATE ES/CS DATA DEFINITIONS FOR
INSERT VALUES
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDP10E
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

-
-
-

ARGUMENTS:

LANG-NO = RECRD
ID-FILE-NAME = DSPLY [X(30)]
FD-FILE-NAME = DSPLY [X(30)]
WORK-FILE-NAME = DSPLY [X(30)]
PROC-FILE-NAME = DSPLY [X(30)]
ES-ACTION-LIST = RECRD
ES-VALUE-USED = DSPLY [99]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDM MODULES
LANGNO - SOURCE LANGUAGE VARIABLE
ESAL - EXTERNAL SCHEMA ACTION LIST
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

CDPIC

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ERRPRO

CALLED DIRECTLY BY:

CDPIO - BUILD CALLS AND MESSAGES INTO THE USERS
APPLICATION PROCESS

USED IN MAIN PROGRAM(S):

CDPIO - BUILD CALLS AND MESSAGES INTO THE USERS
APPLICATION PROCESS

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDP10F
PURPOSE: GENERATE WORKING STORAGE VARIABLES TO
HOLD ES RESULTS
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDP10F
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

ARGUMENTS:

LANG-NO = RECRD
CS-ACTION-LIST = RECRD
ES-ACTION-LIST = RECRD
FD-FILE-NAME = DSPLY [X(30)]
WORK-FILE-NAME = DSPLY [X(30)]
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDM MODULES
LANGNO - SOURCE LANGUAGE VARIABLE
CSAL - CONCEPTUAL SCHEMA ACTION LIST
ESAL - EXTERNAL SCHEMA ACTION LIST
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

CDPIC
ERRPRO

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CALLED DIRECTLY BY:

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
APPLICATION PROCESS

USED IN MAIN PROGRAM(S):

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS
APPLICATION PROCESS

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BUILD CALLS AND MESSAGES Module Documentation

NAME: CDUEMV
PURPOSE: GENERATE EXTERNAL/CONCEPTUAL SCHEMA MOVE
STATEMENTS
LANGUAGE: VAX-11 COBOL
MODULE TYPE: SUBROUTINE
SOURCE FILE: CDUEMV
SOURCE FILE TYPE: .COB
HOST:
SUBSYSTEM: CDM
SUBDIRECTORY:
DOCUMENTATION GROUP: PS41258

DESCRIPTION:

-
-

ARGUMENTS:

LANG-NO = RECRD
PROC-FILE-NAME = DSPLY [X(30)]
CS-ACTION-LIST = RECRD
CS-QUALIFY-LIST = RECRD
ES-ACTION-LIST = RECRD
ES-QUALIFY-LIST = RECRD
RET-STATUS = DSPLY [X(5)]

INCLUDE FILES:

ERRCDM - IISS ERROR STATUS CODES FOR CDM MODULES
LANGNO - SOURCE LANGUAGE VARIABLE
CSAL - CONCEPTUAL SCHEMA ACTION LIST
CSQUAL - CONCEPTUAL SCHEMA QUALIFY LIST
ESAL - EXTERNAL SCHEMA ACTION LIST
ESQUAL - EXTERNAL SCHEMA QUALIFY LIST
ERRPRO - PROCESS ERROR INCLUDE FILE

ROUTINES CALLED:

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ERRPRO

CALLED DIRECTLY BY:

**CDP10A - GENERATE THE TRANSFORMATION OF ES VALUES AND
 VARIABLES**

USED IN MAIN PROGRAM(S):

CDP10 - BUILD CALLS AND MESSAGES INTO THE USERS APPLICATION PROCESS

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3.10.9 Include File Descriptions

The following list contains a purpose and description of each include file listed in 3.10.4 as specified in the source code. The language it is written in is also given.

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: APL
PURPOSE: JOIN QUERY ATTRIBUTE PAIR LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**CONTAINS INFORMATION ABOUT THE JOIN
ATTRIBUTES FOR NDML SUBTRANSACTIONS**

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1 November 1985

BUILD CALLS AND MESSAGES Include File Description

FILE NAME: CGTABLE
PURPOSE: CODE GENERATING TABLE- TRACKS ALL GENERATED SOFTWARE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CODE GENERATOR TABLE, HOLDS PERTINENT RESULTS
ABOUT ALL CODE GENERATED OR MODIFIED BY THE
PRECOMPILER
NOTE: ROW 100 RESERVED FOR SWAPPING DURING SORTING.

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: CHKCDM
PURPOSE: IISS CDMP CHECK STATUS CODES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL STATUS CODES FOR THE
CDMP MODULES

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: CSAL
PURPOSE: CONCEPTUAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

TABLE TO HOLD CONCEPTUAL DATA ABOUT THE REQUEST

THE CONCEPTUAL SCHEMA ACTION LIST

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: CSQUAL
PURPOSE: CONCEPTUAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**CONTAINS CONCEPTUAL SCHEMA INFORMATION FOR
THE REQUESTS QUALIFICATION**

THE CONCEPTUAL SCHEMA QUALIFY LIST

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: ERRCDM
PURPOSE: IISS ERROR STATUS CODES FOR CDMP MODULES
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS ALL ERROR CODES USED BY CDMP *
MODULES FOR ERROR HANDLING *

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: ERRPRO
PURPOSE: PROCESS ERROR INCLUDE FILE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: ESAL
PURPOSE: EXTERNAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**CONTAINS THE EXTERNAL SCHEMA INFORMATION FOR AN
NDML REQUEST**

THE EXTERNAL SCHEMA ACTION LIST

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1 November 1985

BUILD CALLS AND MESSAGES Include File Description

FILE NAME: ESQUAL
PURPOSE: EXTERNAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**CONTAINS EXTERNAL SCHEMA INFORMATION FOR THE NDML
QUALIFICATION**

THE EXTERNAL SCHEMA QUALIFY LIST

PS 620141258
1 November 1985

BUILD CALLS AND MESSAGES Include File Description

FILE NAME: ISAL
PURPOSE: INTERNAL SCHEMA ACTION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**CONTAINS INTERNAL SCHEMA INFORMATION ABOUT AN
NDML REQUEST**

THE INTERNAL SCHEMA ACTION LIST

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1 November 1985

BUILD CALLS AND MESSAGES Include File Description

FILE NAME: ISQUAL
PURPOSE: INTERNAL SCHEMA QUALIFY LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

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1 November 1985

BUILD CALLS AND MESSAGES Include File Description

FILE NAME: JQGTBL
PURPOSE: JOIN QUERY GRAPH TELLS HOW TO CONNECT
SUBTRANSACTIONS
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: LANGNO
PURPOSE: SOURCE LANGUAGE VARIABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

CONTAINS THE VALUES FOR THE SOURCE LANGUAGE
OF THE APPLICATION

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: MACCALL
PURPOSE: CALL THE MACRO COPY UTILITY
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**PARAGRAPHS TO SUBSTITUTE PARAMETERS FOR MACRO CALLS
AND TO CALL "CDMACR" ROUTINE**

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: ORCLED
PURPOSE: WS DEFINITION FOR THE ORACLE LOGIN AREA
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THE ORACLE LOGON DATA AREA

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1 November 1985

BUILD CALLS AND MESSAGES Include File Description

FILE NAME: RFTABLE
PURPOSE: THE RESULT FIELD TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**CONTAINS CONCEPTUAL SCHEMA INFORMATION ABOUT
THE RESULTS OF AN NDML REQUEST**

THE RESULT FIELD TABLE

**WHEN CHANGING THE STRUCTURE OF THIS TABLE
BE SURE TO CHANGE THE LAYOUT IN THE
LINKAGE SECTION OF THE DRS (CDS01)
WHICH WAS COPIED FROM THIS.**

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: SBSTLST
PURPOSE: WS DEFINITION FOR THE SUBSTITUTION LIST TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

**SUBSTITUTION-LIST REPRESENTS THE INPUT TABLE
OF SUBSTITUTION PARAMETERS FOR THE CDMACR
MACRO EXPANSION SUBROUTINE**

PS 620141258
1 November 1985

BUILD CALLS AND MESSAGES Include File Description

FILE NAME: SUBPROC
PURPOSE: SUBTRANSACTION PROCESSES ID TABLE
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

THIS TABLE MUST HAVE THE SAME NUMBER OF OCCURS
AS THE RITABLE.INC SINCE THEY ARE PARALLEL
TABLES.

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BUILD CALLS AND MESSAGES Include File Description

FILE NAME: UVABBR
PURPOSE: USER VIEW ABBREVIATION LIST
LANGUAGE: VAX-11 COBOL

DESCRIPTION:

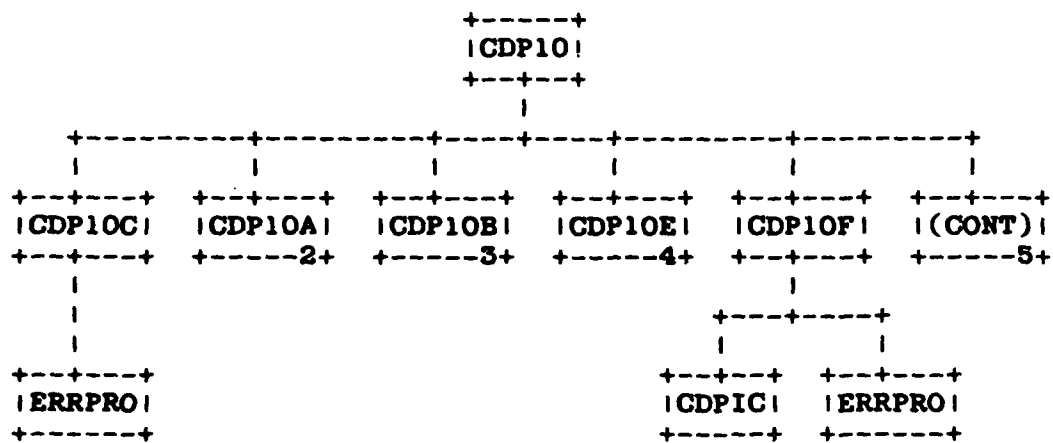
**CONTAINS THE ABBREVIATIONS FOR ALL USER
VIEW REFERENCED IN THE NDML REQUEST**

3.10.10 Hierarchy Chart

The following hierarchy charts show the relationships between all of the modules mentioned in the above documentation. A module may call a subroutine several times within its code, but the call will only be shown once as a single relationship on this hierarchy chart. All modules shown at the top of the first page are considered Main Programs as described in section 3.10.1 above.

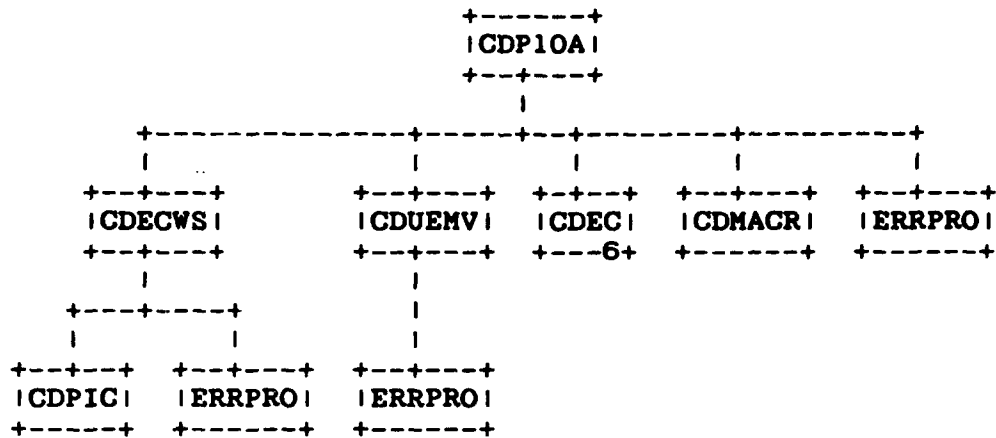
There is an internal paging scheme as marked by the numbers in the upper right corner of each page. An index after the last page of the chart shows where a routine and its calls are first defined. If a routine has no page reference, it either makes no calls or is an external routine. A continuation box on the end of a tree limb shows where that the tree continues on the page numbered mentioned. A number in a box with a routine name points to the page where the routine is further defined within the hierarchy tree. If there is no number in a box, the routine either makes no calls or is an external routine.

1



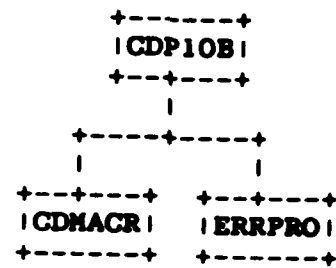
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2



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1 November 1985

3



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1 November 1985

4

```
+-----+  
|CDP10E|  
+-----+  
  |  
+-----+  
  |      |  
+---+---+ +---+---+  
|CDPIC| |ERRPRO|  
+---+---+ +---+---+
```

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5

```

+-----+
|CDP10|
+-----+
|
+-----+-----+-----+-----+
|
+-----+          +-----+ +-----+ +-----+
| (CONT) |          |CDGONS| |CDMACR| |ERRPRO|
+-----1+          +-----+ +-----+ +-----+
|
+-----+-----+-----+-----+-----+
|
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+
| RPTERR| |CDPIC| |OOPEN| |OSQL3| |ODFINN| |(CONT)|
+-----+ +-----+ +-----+ +-----+ +-----+ +-----7+

```

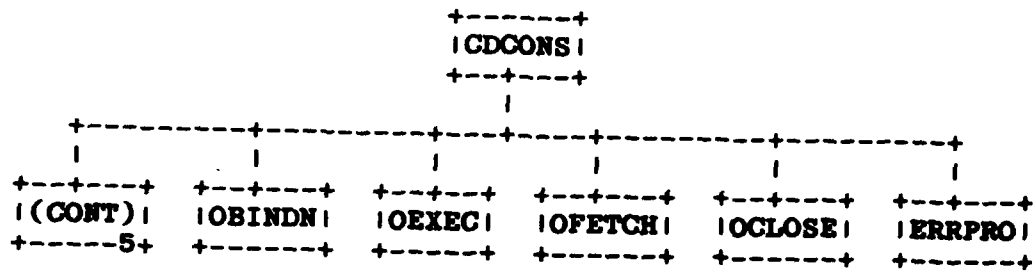
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6

```
      +-----+  
      |CDEC|  
      +-----+  
      |  
+-----+  
|         |         |         |         |         |  
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+  
|OOPEN| |OSQL3| |ODFINN| |OBINDN| |OEXEC| |(CONT)|  
+-----+ +-----+ +-----+ +-----+ +-----+ +-----+8+
```

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7



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1 November 1985

8

```
      +---+
      |CDEC|
      +---+
      |
+-----+-----+-----+-----+
|         |         |         |         |
+---+---+ +---+---+ +---+---+ +---+---+ +---+---+
| (CONT) | | OFETCH | | CDPIC | | OCLOSE | | ERRPRO |
+---+---+ +---+---+ +---+---+ +---+---+ +---+---+
|         |         |         |         |         |
```

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CDCONS.....5
CDEC.....6
CDECWS.....2
CDMACR
CDP10.....1
CDP10A.....2
CDP10B.....3
CDP10C.....1
CDP10E.....4
CDP10F.....1
CDPIC
CDUENV.....2
ERRPRO
OBINDN
OCLOSE
ODFINN
OEXEC
OFETCH
OOPEN
OSQL3
RPTERR

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1 November 1985

3.11 Program Listings Comments

This information is contained in the Module Descriptions in section 3.10.

SECTION 4

QUALITY ASSURANCE PROVISIONS

4.1 Introduction and Definitions

"Testing" is a systematic process that may be preplanned and explicitly stated. Test techniques and procedures may be defined in advance, and a sequence of test steps may be specified. "Debugging" is the process of isolation and correction of the cause of an error.

"Antibugging" is defined as the philosophy of writing programs in such a way as to make bugs less likely to occur and when they do occur, to make them more noticeable to the programmer and the user. In other words, as much error checking as is practical and possible in each routine should be performed.

4.2 Computer Programming Test and Evaluation

The quality assurance provisions for test consists of the normal testing techniques that are accomplished during the construction process. They consist of design and code walk-throughs, unit testing, and integration testing. These tests are performed by the design team. Structured design, design walk-through and the incorporation of "antibugging" facilitate this testing by exposing and addressing problem areas before they become coded "bugs."

END

DATE
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